CONTENTS

Preface iii

THE AQUATIC ENVIRONMENT

PHYSICAL CHARACTERISTICS

Invited

Some trends in physical oceanography. *G. L. Pickard* 1

Frontiers in physical limnology, with particular reference to long waves in rotating basins. *C. H. Mortimer* 9

Contributed

A freshwater geomagnetic electrokinetograph. *Bruce D. Blakkan* . . . 43

Tides and seiches in Green Bay. *Russell L. Johnson* 51

Aerial mapping of surface temperature pattern of Lake Michigan. *J. D. McFadden* and *R. A. Ragotzkie* 55

The thermal structure of Lake Ontario. *G. K. Rodgers* and *D. V. Anderson* 59

Some problems in determining the reference temperature for bathythermograph observation. *Thomas Winterfeld* 70

A synoptic survey of Lake Superior. *D. V. Anderson* and *G. K. Rodgers* 79

Measurements of orbital velocities in water waves. (Abs.) *Thomas R. Mee, Jr.* 90

Lake Erie: recent observations on some of its physical and chemical properties. (Abs.) *G. K. Rodgers* 90

CHEMICAL CHARACTERISTICS

Invited

Some chemical aspects of the marine environment. *Donald W. Hood* . . 91

Chemical characteristics of fresh water. *F. R. Hayes* 112

Contributed

Quantitation of microorganic compounds in water of the Great Lakes by adsorption on activated carbon. *S. L. Daniels, L. L. Kempe, E. S. Graham,* and *A. M. Beeton* 118

Radioactivity levels in Lake Michigan: a preliminary report. *Clifford Risley, Jr.* 124

Factors associated with low dissolved oxygen concentrations in Lake Erie. (Abs.) *J. F. Carr, A. M. Beeton,* and *H. Allen* 133

Oxygen deficit rates for the central basin of Lake Erie. (Abs.) *Nelson A. Thomas* 133

GEOLOGICAL AND METEOROLOGICAL CHARACTERISTICS

Invited

Geological and sedimentary characteristics of the freshwater environment. *Jack L. Hough* 134

Meteorological factors affecting the freshwater environment. *J. P. Bruce* 140

Contributed

The evolution of bay-head bars in western Lake Superior. *William G. Loy* 150

Modern pseudo-upwarping around Lake Erie. *Wm. F. MacLean* 158

Problems of dating abandoned shorelines in the Lake Huron basin. *J. Terasmae* and *R. J. Mott* 169

Research aspects of Lake Ontario regulation. *Benjamin G. DeCooke* 173

Natural regulation of the Great Lakes. *L. Bajorunas* 183

Additional evidence of lowering of Lake Michigan - Huron levels. *Ivan W. Brunk* 191

Meteorological factors affecting ice cover on the Great Lakes. *T. L. Richards* 204

Some characteristics of the winter ice cover of Lake Michigan, 1962-63. *John A. Heap* 216

Relation of winds, water levels and water temperatures to currents in lower Lake Michigan. *Frank R. Bellaire* 219

The 14-hour period of Lake Erie. (Abs.) *George W. Platzman* and *Desiraju B. Rao* 231

Loss of level on Lakes Michigan and Huron occasioned by improvements for navigation. (Abs.) *H. A. Musham* 234

Shipboard automatic digital meteorological data system. (Abs.) *Vincent E. Noble* 234

A lake snow mechanism contributing to areas of snowfall tending to parallel the lake shore. (Abs.) *George C. Williams* . . . 235

BIOLOGICAL INTEGRATORS

Invited

Some biological characteristics of the marine environment. *Bostwick H. Ketchum* 236

The biological characteristics of fresh water. *George W. Saunders* 245

Contributed

The bottom fauna of western Lake Erie 1951-52. *Kenneth G. Wood* 258

New collecting and recording devices for limnological and oceanographic research. (Abs.) *S. Niskin* and *J. I. Jones* 266

Influence of mineral composition of natural waters on strontium accumulation and discrimination by freshwater phytoplankton. (Abs.) *J. S. Marshall* and *A. M. Beeton* 266

An enconometric model of the market for yellow perch. (Abs.) *W. H. Locke Anderson* and *W. L. L'Esperance* 266

Burrowing mayfly nymphs in western Lake Erie previous to 1947. (Abs.) *David C. Chandler* 267

Some changes in the bottom fauna of the island area of western Lake Erie in the decade 1953-1963, with special reference to the aquatic insects. (Abs.) *N. Wilson Britt* 268

Changes in the bottom fauna of Lake Erie, west of the islands, 1930-1961. (Abs.) *J. F. Carr* and *J. K. Hiltunen* 268

WATER RESOURCES

Invited

Biologists as organization men in water resources. *Charles E. Renn* 269

Scientists and the marine water resource. *James B. Lackey* 273

The scientist and water pollution control research. *Bernard B. Berger* 280

Water resources management—the scientist's contribution. *Loring F. Oeming* 288

Scientific research and water quality management. *H. W. Poston, W. Q. Kehr,* and *C. R. Ownby* 292